

WISENET Webinar

Notice

- Please mute your audio and put into listen only mode.
- This webinar is being recorded and will be available for replay
- We will take Q&A time permitting and if time runs out to answer all of the questions, we will reply to you individually afterwards.
Please use Chat for Q&A.



Wisenet

AI Camera

With Deep Learning Technology

SAE Team | 2020.01.09



Wisenet

Agenda

- **AI Camera Introduction**
 - Deep Learning Technology
 - AI Camera Line-up & Specifications
 - AI Camera Features
- **AI Camera VMS Integration**
 - How to configure AI features
 - Wisenet WAVE Integration
 - Wisenet SSM Integration
 - milestone Integration



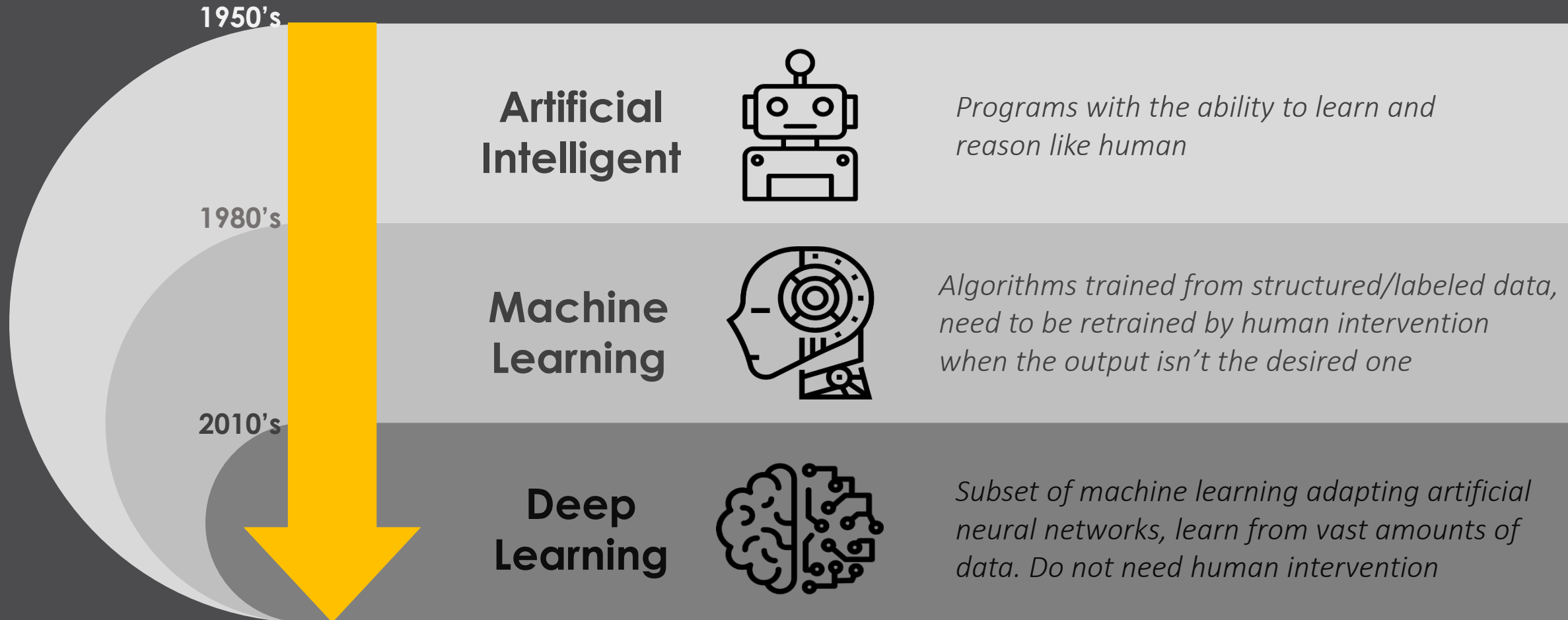
Deep Learning Tech.



AI Camera

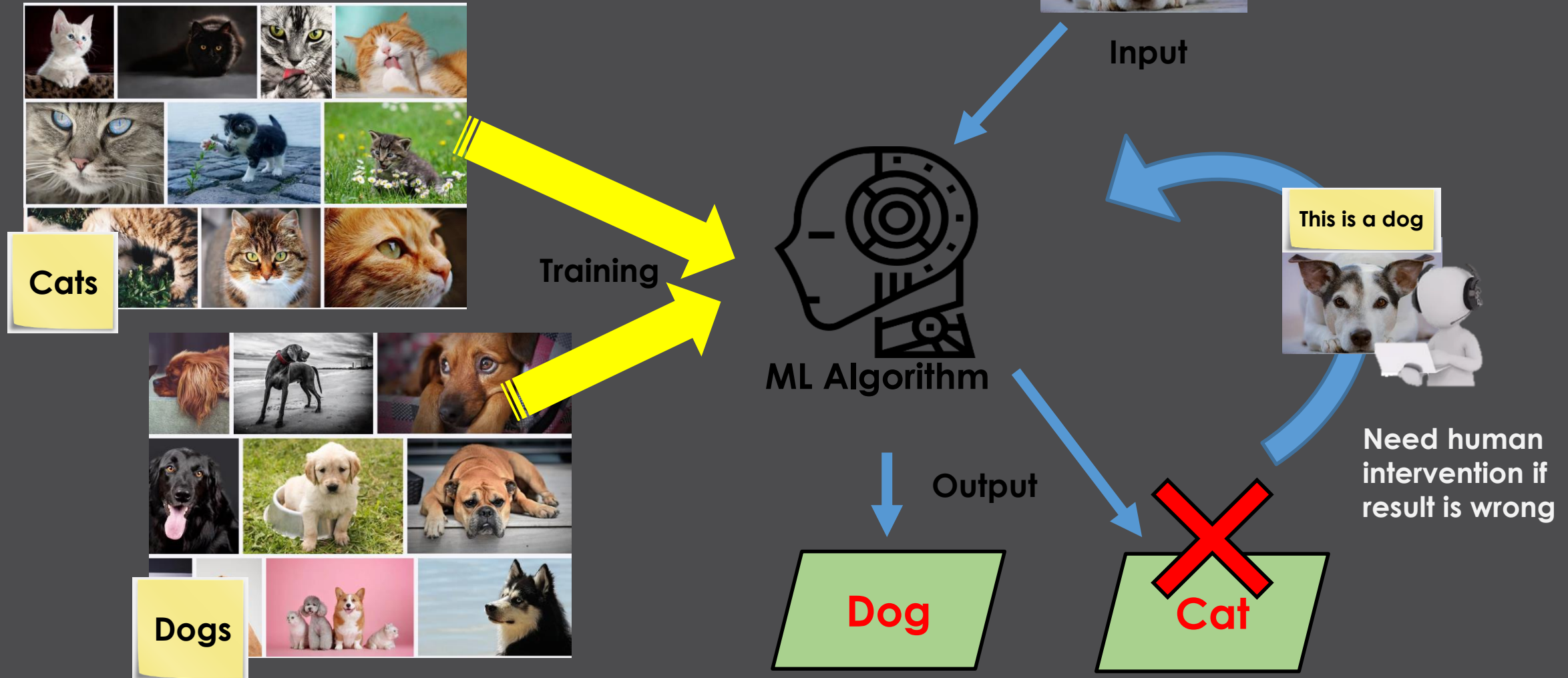
AI vs. Machine Learning vs. Deep Learning

What is difference?



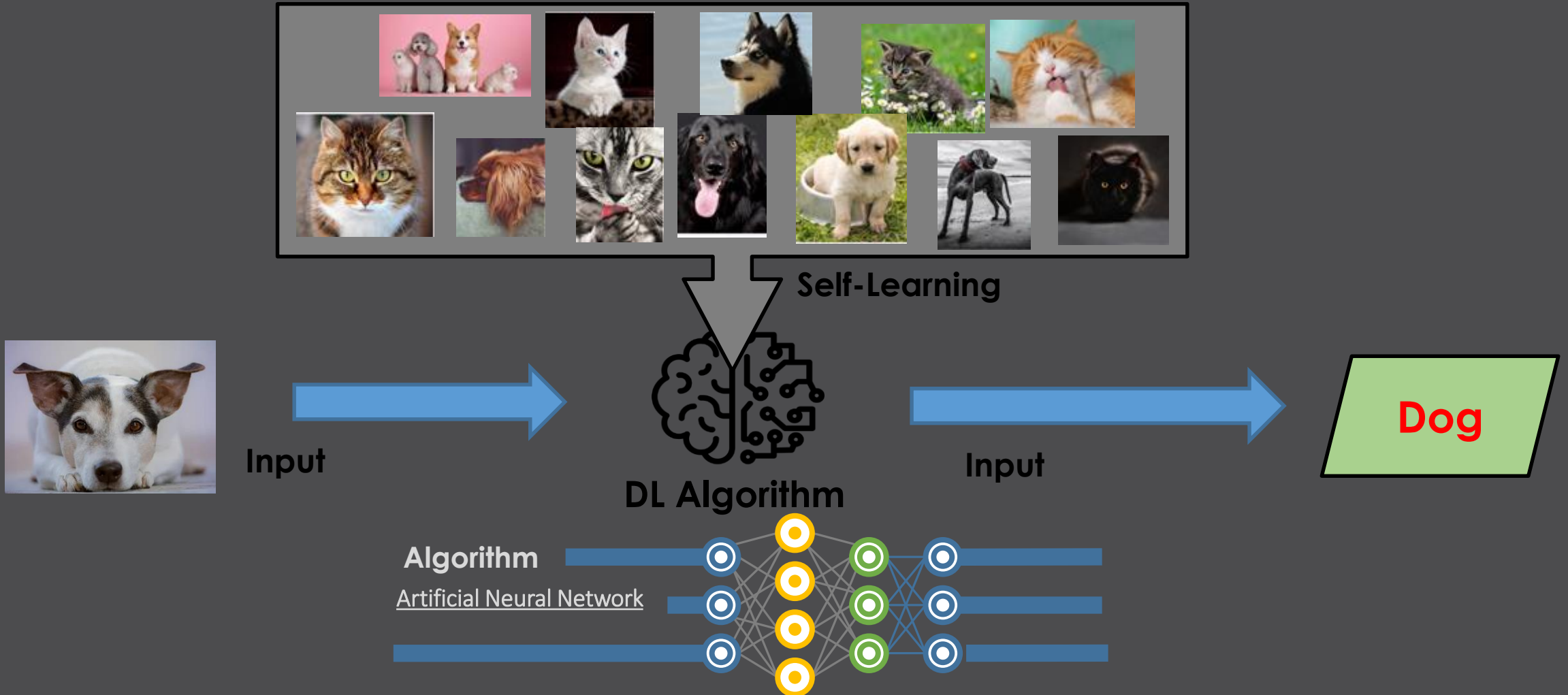
Machine Learning

- Trained by structured & labeled data, They still need some guidance
- If the result is incorrect, an engineer has to step in and make adjustments



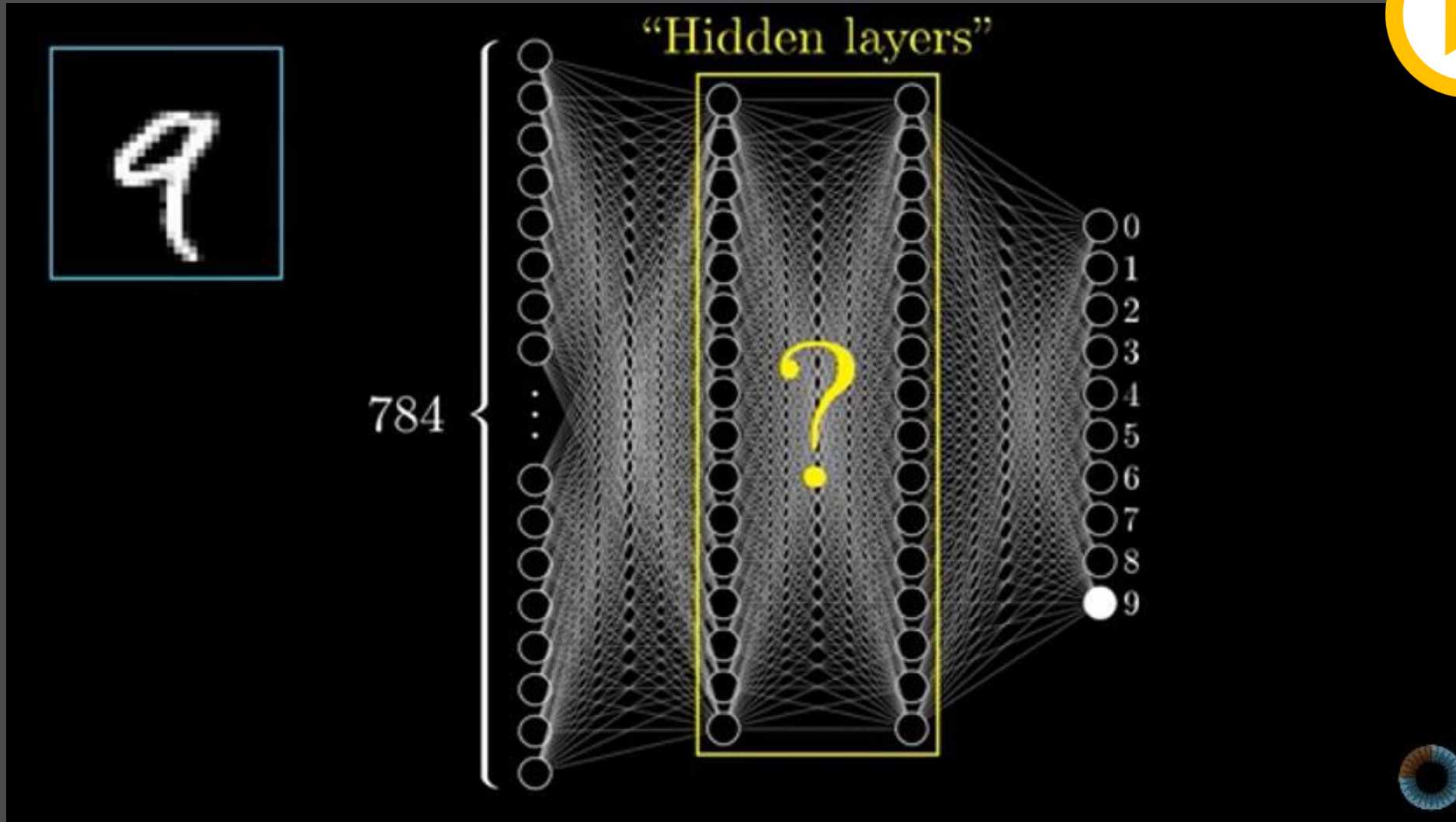
Deep Learning

- Deep learning applications use a layered structure of algorithms called an artificial neural network



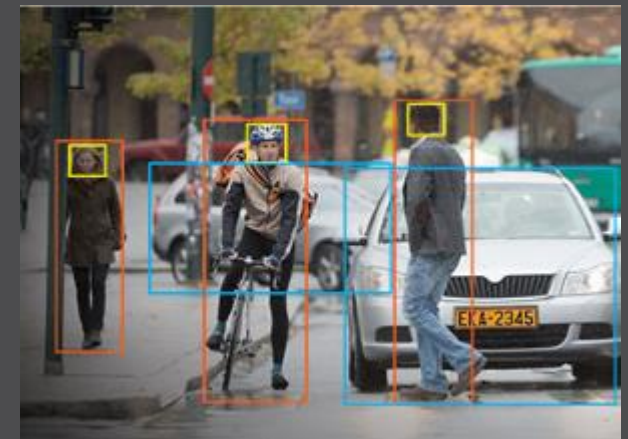
Deep Learning | Neural Network

Neural network for determining 1~9 digit



Deep Learning with Video Surveillance

- Security Overall : False Alarm Reduction
 - Big issue for especially Security Company
 - Reducing false alarm > Saving huge cost and resources
- Retail vertical : Gathering big data and market trend
 - Using attribute such as gender, age and even customer's reaction (smile, angry, unhappy..etc)
- City surveillance : Quick and detail search
 - Using attribute for description of the suspect (Glasses, Beard, Clothes, Color...etc)
 - Tracking the suspect's path of travel
- Access Control : Face recognition for black/white list alarm
- Customized application : Skeleton Analytics, Traffic Analytics...etc





Wisenet AI Camera



AI Camera

Wisenet AI Camera

Naming Rule

Model naming rule for AI Camera



Box
Bullet
Vandal
Dome
Dome | Flush

PNB-A9001
PNO-A9081R
PNV-A9081R
PND-A9081RV
PND-A9081RF



Dome/Flush Type

PND-A9081RV/A9081RF

- Lens
 - 4.5~10mm(2.2x) motorized varifocal
- Video/Network
 - Codec : H.264, H.265, MJPEG
 - Resolution : 4K
- Features
 - IR
 - WDR : 120dB
 - New Wisenet AI algorithm included
 - Object detection
 - Bestshot
 - Attributes
 - Retail Insight integration
- Environment
 - IP52, IK10
 - 2ea SD slots
 - USB&CVBS for installation
 - Audio In/Out, Alarm In/Out
 - PoE+, 12VDC
 - DC12V for external device

SBC-160B (Skin Cover)

PND-A9081RV

PND-A9081RF



Vandal Dome Type

PNV-A9081R

- Lens
 - 4.5~10mm(2.2x) motorized varifocal
- Video/Network
 - Codec : H.264, H.265, MJPEG
 - Resolution : 4K
- Features
 - IR
 - WDR : 120dB
 - New Wisenet AI algorithm included
 - Object detection
 - Bestshot
 - Attributes
 - Retail Insight integration

- Environment
 - IP66, IP67, IP6K9K, IK10+, NEMA4X
 - 2ea SD slots
 - USB&CVBS for installation
 - Audio In/Out, Alarm In/Out
 - PoE+, 12VDC
 - DC12V for external device

SBC-160B (Skin Cover)

PNV-A9081R



Bullet(One-Body) Type

PNO-A9081R

- Lens
 - 4.5~10mm(2.2x) motorized varifocal
- Video/Network
 - Codec : H.264, H.265, MJPEG
 - Resolution : 4K
- Features
 - IR
 - WDR : 120dB
 - New Wisenet AI algorithm included
 - Object detection
 - Bestshot
 - Attributes
 - Retail Insight integration
- Environment
 - IP66, IP67, IK10, NEMA4X
 - 2ea SD slots
 - Backbox (*XNO-8080R Design*)
 - USB&CVBS for installation
 - Audio In/Out, Alarm In/Out
 - PoE+, 12VDC
 - DC12V for external device

PNO-A9081R



Box Type

PNB-A9001

- Lens
 - i-CS lens support
- Video/Network
 - Codec : H.264, H.265, MJPEG
 - Resolution : 4K
- Features
 - WDR : 120dB
 - New Wisenet AI algorithm included
 - Object detection
 - Bestshot
 - Attributes
 - Retail Insight integration
- Environment
 - 2ea SD slots
 - USB&CVBS for installation
 - Audio In/Out, Alarm In/Out
 - RS-485 for remote control
 - PoE+, 12VDC
 - DC12V for external device

PNB-A9001



Feature | False Alarm Reduction

Object Detection

- AI engine can recognize the object type and can more accurately filter out false alarms
 - Only detecting valuable object type, ignoring non-important object type
 - Waving trees / Video noise / Moving shadow....etc



False Alarm Filtering
by Object Classification

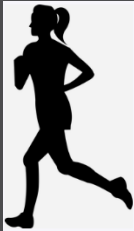


Feature | False Alarm Reduction

Object Detection

- Wisenet P-Series AI Camera can classify following objects

- Human Detection

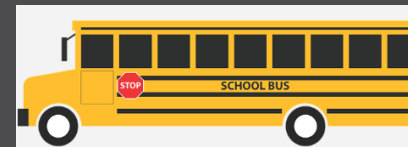


Person



Face

- Vehicle Detection



Vehicle



Number Plate

Feature | False Alarm Reduction



- Dramatically reduce false alarms because AI algorithm can recognize object type



Traditional VA



Deep learning VA

Feature | False Alarm Reduction

Object Detection Configuration

- Based on AI algorithm camera will detect only selected object, Alarm accuracy will be a lot improved

Basic

PTZ

Video & Audio

Network

Event

Analytics

Shock detection

Motion detection

Tampering detection

Defocus detection

Object detection • AI

IVA • AI

Audio detection

Sound classification

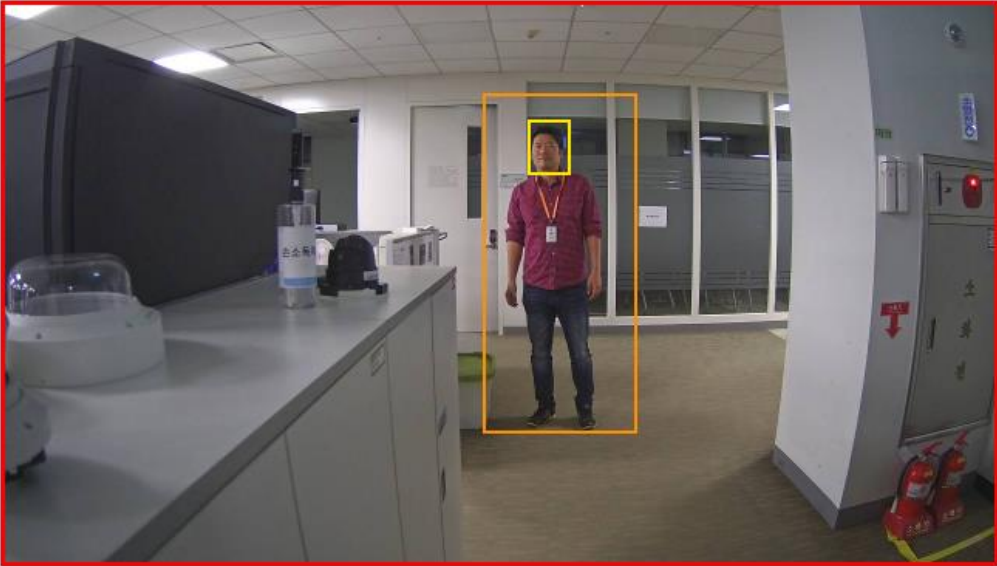
Statistics

System

Object detection

Select channelCH12

☒ Enable object detection

Object	Exclude area	Common	BestShot
			

Object detection

Type	Enable
Person	☒
Vehicle	☒
Face	☒
License plate	☒

Minimum duration (s)

-

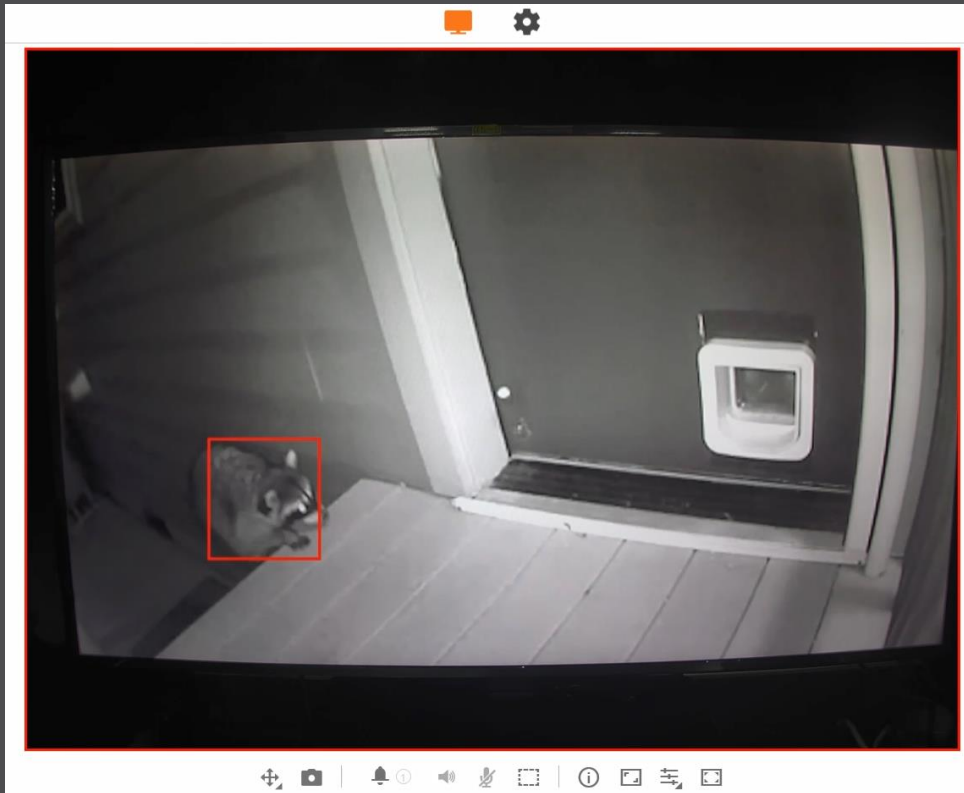
+

1

Feature | False Alarm Reduction



- Demonstration (Webviewer)



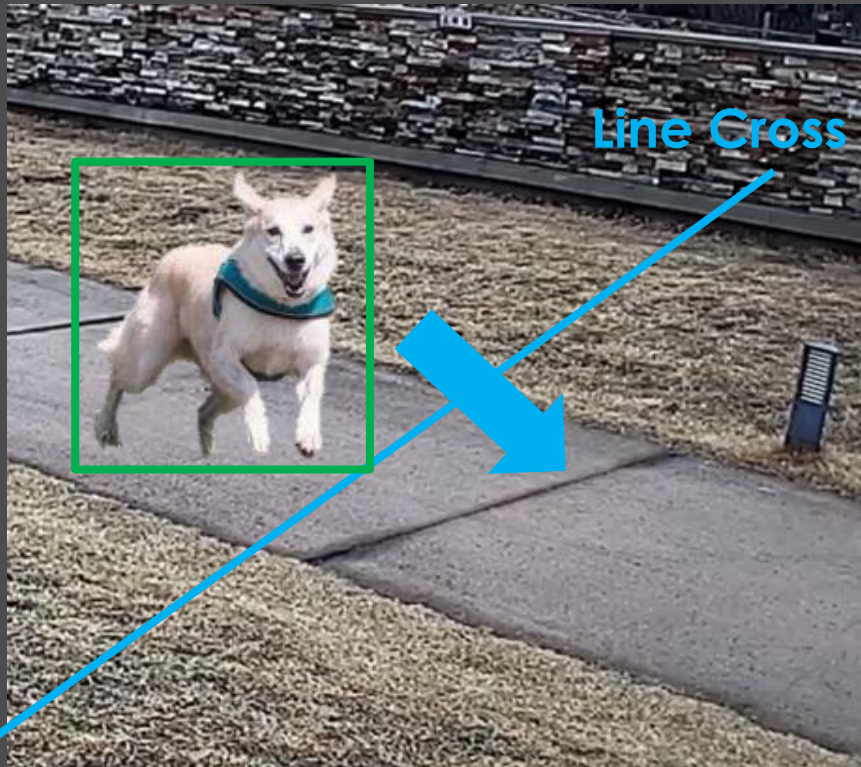
Traditional VA



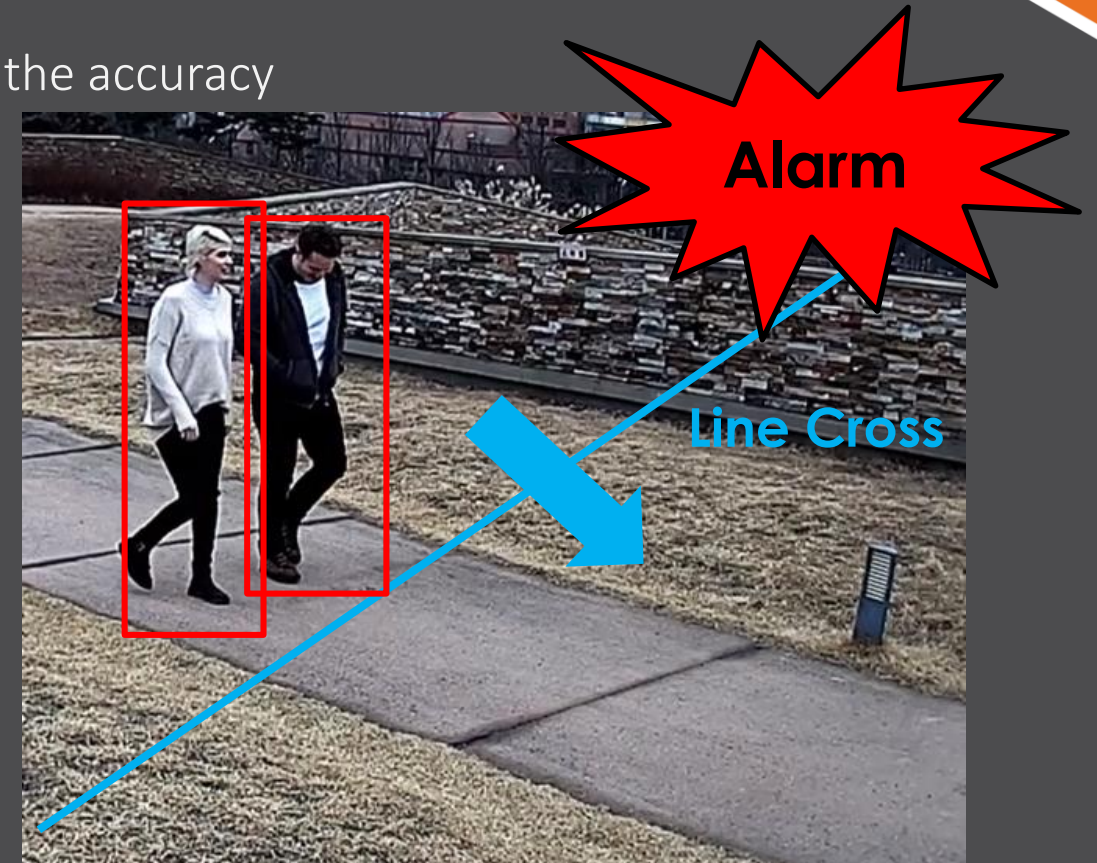
Deep learning VA

Feature | Intelligent Video Analytics

- Combining with traditional IVA, we can greatly improve the accuracy



Alarm not triggered by animal detection



Alarm triggered by human detection

Feature | Intelligent Video Analytics

IVA Configuration with AI algorithm

- Object Detection can be combined with IVA : Virtual Line, Virtual Area, Intrusion, Appear/Disappear, Loitering

Basic

PTZ

Video & Audio

Network

Event

Analytics

Shock detection

Motion detection

Tampering detection

Defocus detection

Object detection • AI

IVA • AI

Audio detection

Sound classification

Statistics

System

Open platform

IVA (Intelligent Video Analytics)

Select channelCH12

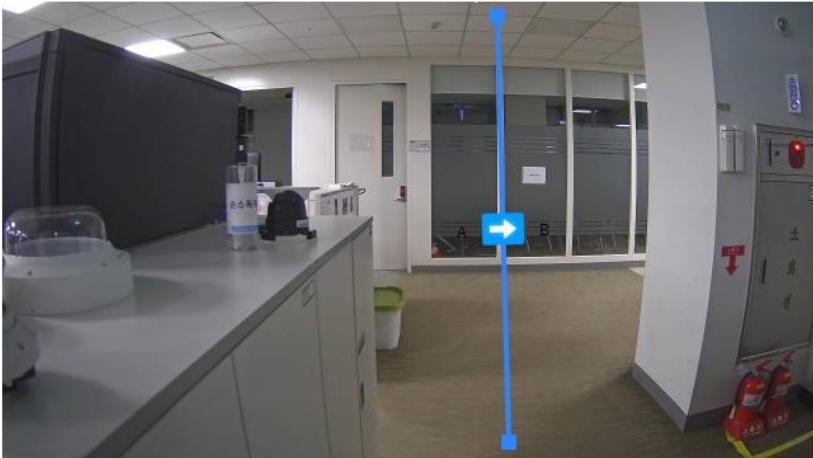
☒ Enable IVA

Virtual line

Virtual area

Exclude area

Common



Line

12345678

Name

Object

Type	Enable
Person	☒
Vehicle	☒

Categories

☒ Crossing

Direction

☒ A → B

☐ A ← B

☐ A ↔ B

Handover

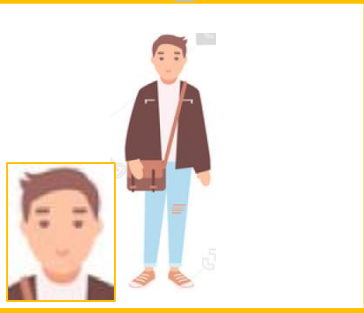
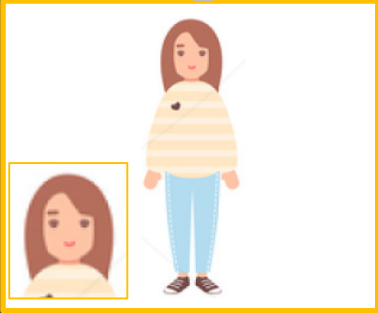
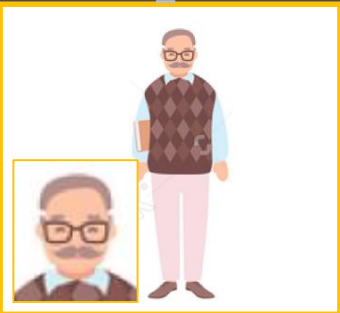
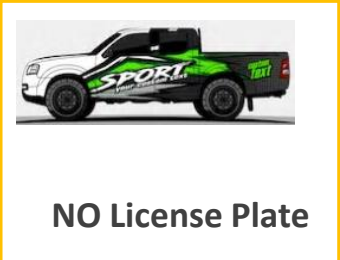
Off

Feature | Object Capture & Attribute

- Capturing image of Person(Human Body), Face, Vehicle, License Plate...etc
- Gathering metadata for specific attribute so system can use the data for forensic search

Object Capture

Attribute

	20190225 10:30:29	20190225 10:30:32	20190225 10:30:33
HUMAN			
CAR			

HUMAN	Gender : Female, Male Age : Young, Adult, Middle, Senior Clothing Color : Upper, Lower Accessory : Bag, Glasses
CAR	Vehicle Type : Bus, Truck, Bike... Vehicle Color : Black, White, Red, Blue... License Plate

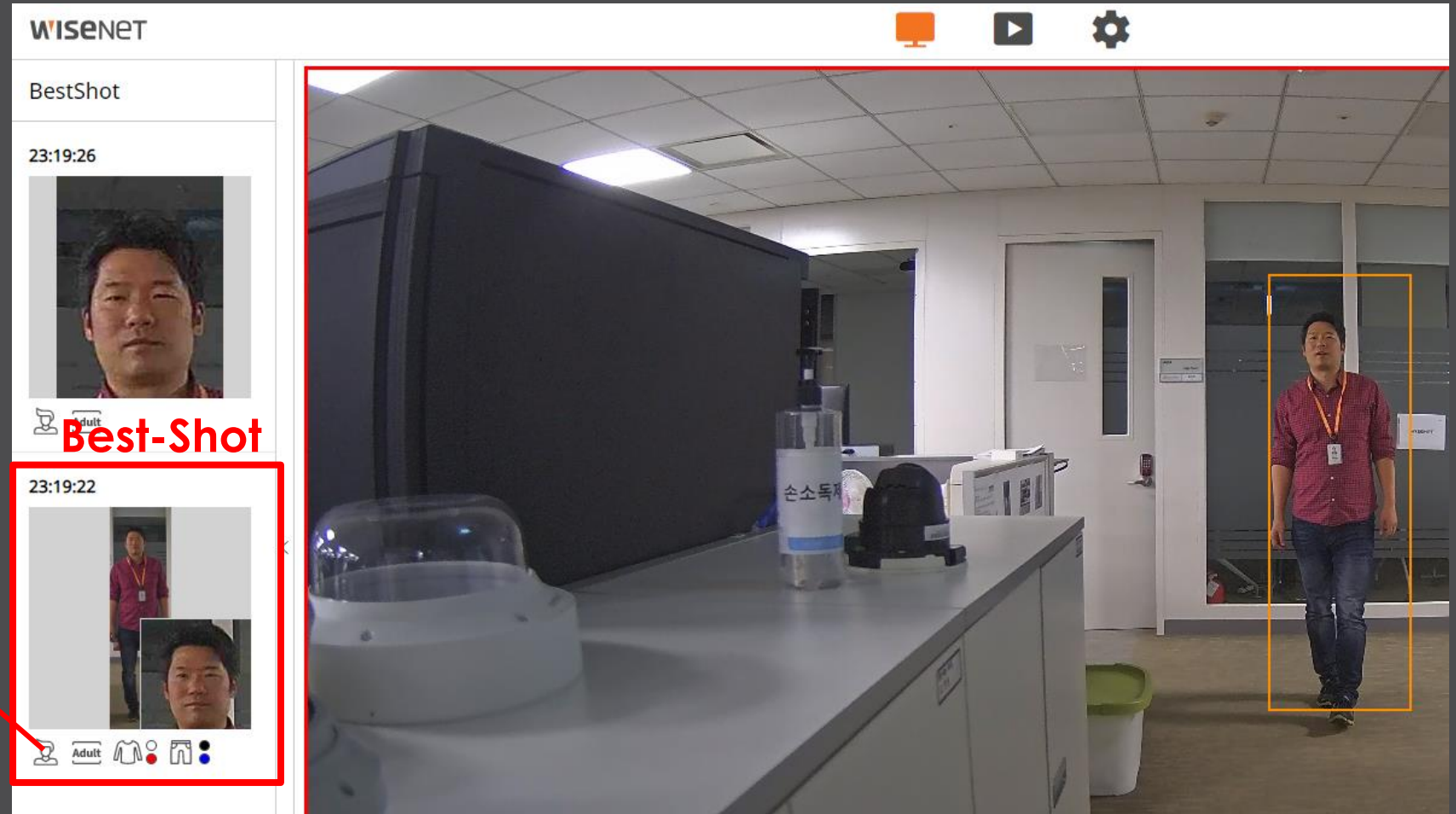
Feature | Object Capture & Attribute

- Best-shot with attributes is displayed on web viewer in real-time

Attributes



- Male
- Adult
- Top : White + Red
- Bottom : Black + Blue



Feature | Object Capture & Attribute

Attributes	Objects	Attributes	Supported attributes items
	Person	Gender	Female, Male
		Upper(Color)	Black, Gray, White, Red, Orange, Yellow, Green, Blue, Purple (up to 2 colors at the same time)
		Lower(Color)	
		Bag	Carry Bags or Not
	Face	Gender	Female, Male
		Age	Young/Adult/Middle/Senior
		Glasses	Wear Glasses or Not
	Vehicle	Type	Car(Sedan/SUV/Van...etc), Bus, Truck, Motorcycle, Bicycle, Train
		Color	Black, Gray, White, Red, Orange, Yellow, Green, Blue, Purple (up to 2 colors at the same time)

Feature | Forensic Search using attributes

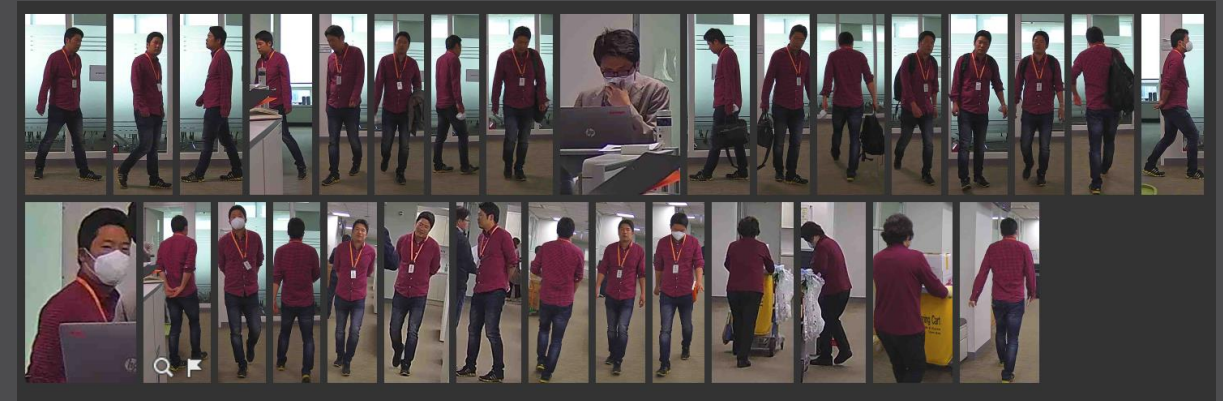
- Forensic search with attributes can greatly reduce playback time to search video evidences



24 Hours Footage with 1,000+ people snapshots



- Attributes Search
: Male + Red top

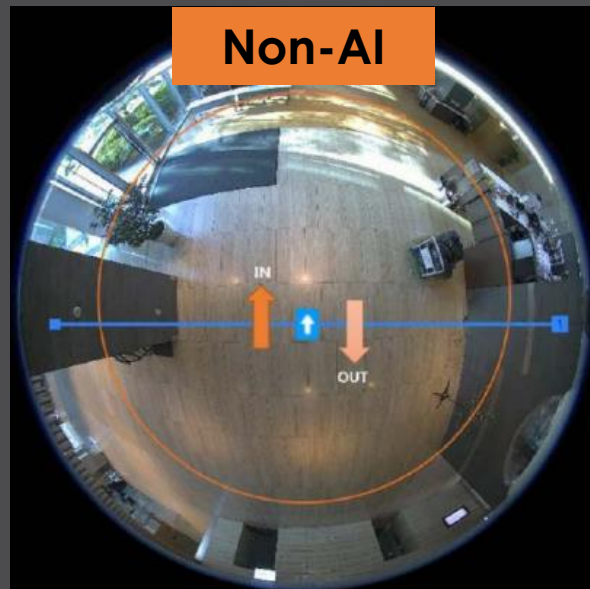


Reduced to only 20~30 snapshots

Feature | Upgraded Business Intelligence

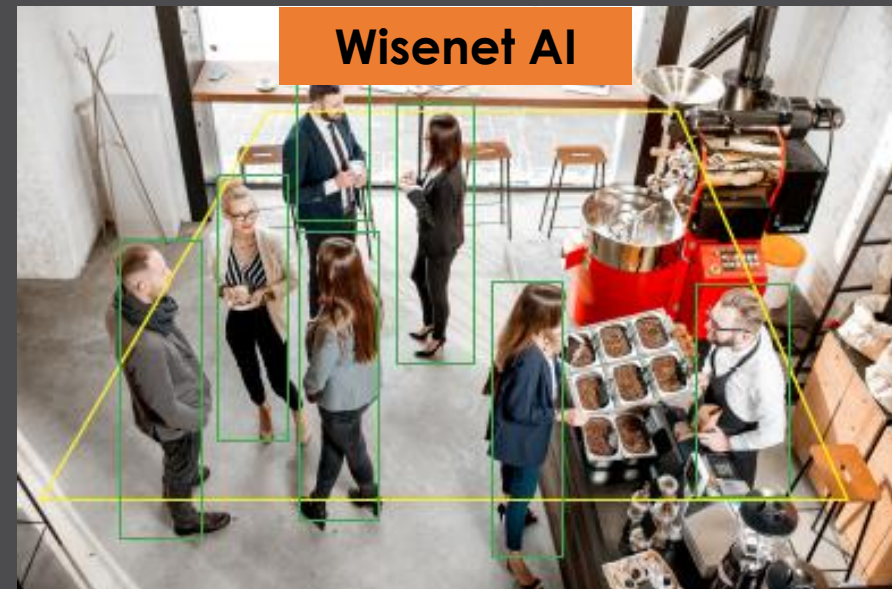
Improved People Counting

- Applied new AI algorithm
 - Not only people counting but also live monitoring can be used with one camera
 - Accuracy improved with AI object classification
 - Integrated with **Wisenet Retail Insight v2.0**
: Gender & Age counting is available with AI camera



- Overhead view only
- Rule based detection – Moving object
- Only counting visitors

VS



- Normal view, useful for surveillance
- Based on object detection for higher accuracy
- Additional metadata : Gender & Age

Feature | Upgraded Business Intelligence

Improved People Counting

- Applying new AI algorithm allows flexible installation environments

[People Counting with surveillance view]



Conventional look down position

[Queue Management from side-view]



Conventional based on pixel change

Feature | Digital Auto-Tracking (CH2)



- Wisenet AI camera has 2CH, CH#1 for overview, CH#2 for digital auto-tracking
 - More smarter Digital Auto-tracking with new AI algorithm : provide option of Person/Vehicle
 - CH2, crop streaming, max.Full HD(1080p) or below resolution support

The screenshot displays the Wisenet WEBVIEWER interface. The browser address bar shows the URL: 192.168.10.110/wmf/index.html#/setup/ptzSetup_dptzSetup. The interface includes a sidebar menu with options: Basic, PTZ, Digital PTZ (selected), Video & Audio, Network, Event, Analytics, Statistics, System, and Open platform. The main content area is titled "Digital PTZ" and features a "Select channel" section with tabs for "Preset" and "Group". The "Preset" tab is active, showing a live video feed of a laboratory setting. To the right of the video feed is a control panel with a directional pad and a table for object tracking settings.

Object	Enable
Person	☒
Vehicle	☐

Below the video feed, there are buttons for "Go", "Add", and "Remove". At the bottom, there are input fields for "Number" (set to 1) and "Name".

Feature | Enhanced DC Output

- DC Output for external devices
 - Use case #1 : When “Object Detection” event trigger, LED “on”
 - Use case #2 : PIR sensor, glass break detectors

Common event list

Use	Type	FTP	E-mail	Record	Alarm output 1
☒	▶ Alarm input 1	☐	☐	☐	Off ▼
☐	▶ Time schedule	☐			
☐	▶ App event	☐	☐		
☐	▶ Network disconnection			☐	Off ▼

Select channel

CH 1 2

Channel event list

Use	Type	FTP	E-mail	Record	Alarm output 1
☐	▶ Motion detection	☐	☐	☐	Off ▼
☒	▶ IVA	☐	☐	☐	Off ▼
☐	▶ Tampering detection	☐	☐	☐	Off ▼
☐	▶ Defocus detection	☐	☐	☐	Off ▼
☐	▶ Shock detection	☐	☐	☐	Off ▼
☐	▶ Audio detection	☐	☐	☐	Off ▼
☐	▶ Sound classification	☐	☐	☐	Off ▼
☒	▶ Object detection	☐	☐	☐	Off ▼

PNB-A9001(Ex)

Note

1: Alarm 1

Input

2: Alarm 2

Output

3: GND

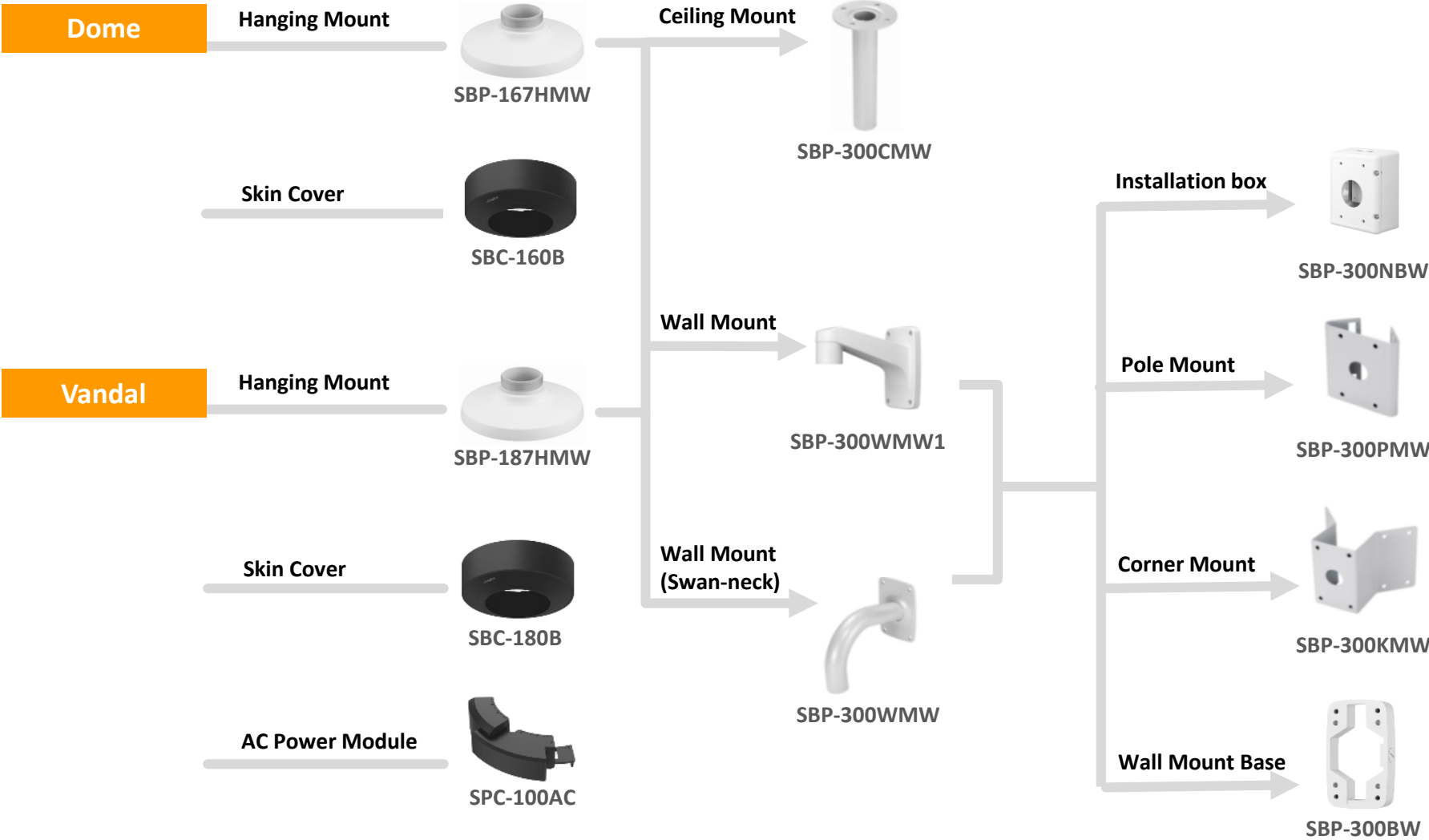
4: Alarm out

12V DC,
Max load ~ 50mA

5: GND(DC)

0V DC

Accessory (White)



Wisenet AI Camera

Accessory (White)

Bullet

Pole Mount



SBP-302PM

Box

Fixed Housings



SHB-4300HP



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